

Editorial

Analysis and Models in Interdisciplinary Mathematics 2015

L. Jódar¹ and E. De la Poza²

¹*Instituto Universitario de Matemática Multidisciplinar, Universitat Politècnica de València, Building 8G, Camino de Vera s/n, 46022 Valencia, Spain*

²*Facultad de Administración y Dirección de Empresas, Universitat Politècnica de València, Building 7J, Camino de Vera s/n, 46022 Valencia, Spain*

Correspondence should be addressed to L. Jódar; ljodar@imm.upv.es

Received 14 June 2015; Accepted 15 June 2015

Copyright © 2015 L. Jódar and E. De la Poza. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

The aim of this special issue is to relativize some myths about the publication of research papers. It is clear that an evaluation is necessary because what is not evaluated tends to be devalued. Yet a rigorous evaluation is certainly a challenging task, and even more so when the person in charge of it is not acknowledged and adequately endorsed. Undoubtedly, the role of the reviewer is damaged by this critical drawback.

The professional careers of academics are strongly linked to the publication of papers. As a result, there is an overdose of published papers read by scarcely nobody. The peer review process is often used in academia to evaluate the suitability of publishing a paper. However, the acceptance of papers for their publication should not be limited to obtain scientific results by applying novel techniques to problems that have already been solved by other techniques, as this only extends the literature, but not scientific knowledge. Thus any published paper must incorporate innovation in the modeling, the technique, or the application.

Only those cutting edge papers are worthy of readers' attention and time who must, to a certain point, be lured, stimulated, and impacted by the brilliance and outstanding excellence of the paper. This qualitative impact may proceed from the modeling, the technique, or the application.

Those in favor of peer review evaluations argue that papers improve after peer review evaluations; see [1]. This is true in some cases but is not always the case as there are times when the reviewer directly rejects the paper, as s/he is incapable of identifying innovation in modeling or novelty in

applications instead of the more classical innovation found in theorems.

Unfortunately, this kind of misevaluation is quite frequent, and the concern remains unsolved. As Tachi Yamada said, "innovation has no peer reviews, by definition," [1] and so, editors have an important task when selecting appropriate reviewers. An appropriate reviewer for a paper can be totally inappropriate for another paper, which can become a problem that claims an editorial solution.

Academic people are used to specializing their research activity, and it is common for researchers to spend essentially their whole lives working in a very narrow area. Peer evaluation processes are positive and easy to perform among theoretical papers, but not so easy for interdisciplinary papers because the reviewer requires not only expertise, but also open-mind behavior. A collateral negative effect of peer evaluation is lack of creativity and innovation in research as a result of the narrow vision from reviewers; reviews quite often underestimate innovation from modeling or its application.

At the present time, the impact factor is applied as a dogmatic measure of the quality of the published papers. However, we assume that the number of citations received by a published paper is an indicator of excellence that should be questioned in some way. Imagine, for instance, the quality of music, literature, or TV measured throughout this indicator; the results obtained by this indicator would be astonishing. Uncertainty about the convenience of this indicator is even more debatable when there is proof that an abounding number of papers are quoted without being read or after being read briefly, like reading the abstract; see [2, 3].

Are we looking for an impact factor or an innovation factor? If the genuine number of followers, or what is the same, the number of citations, could be an admissible indicator for theoretical papers, the amount of followers or cites for interdisciplinary papers would not be a good indicator at all because potential readers of the applied areas would be slow to know the results and would not be able to often use results that require expertise in several areas. Expertise among interdisciplinary papers adds complexity to the editor's task of finding the appropriate reviewer.

This special issue includes several multidisciplinary papers relating mathematics to biomedicine, biology, electoral behavior and terrorism, finance, and engineering.

In biomedicine section, O. Angulo et al. develop the numerical integration of numerical integration second-order model described by a mixed variable coefficient partial differential problem. Also in biomedicine area, A. Garcia-Rudolph and K. Gibert use a data mining approach for visual and analytical identification in traumatic brain injury cognitive rehabilitation.

Biological applications include the paper of S. Kindermann and S. Papáček who formulate and solve the problem of relevant recovery after photobleaching (FRAP) to determine the mobility of fluorescent molecules within living cells. Theoretical findings are illustrated by the comparison of results when datasets are used in different ways.

Inside of biological models we find the work of F. J. Solis and R. A. Ku-Carrillo who develop a family of age structured predator-prey models with cannibalism in the prey. Models are described by a set of ordinary differential equations. The authors discuss the effect of new birth rates and coexistence of the involved species in the solution.

The short term effect of terrorism attacks in the electoral behavior of citizens is studied by J.-C. Cortés et al., using a probabilistic population model when one studies the impact after the March 11, 2004, attacks in Madrid.

Finance mathematics is represented by the work of I. Gómez-Valle and J. Martínez-Rodríguez dealing with jump-diffusion models for estimating the risk-neutral drift and jump intensity of interest rates. The authors estimate the risk neutral jump size directly from data market and show the importance of this fact by using numerical experiments.

Finally, abstract numerical methods of general applications for solving nonlinear systems are studied by S. Artidiello et al., who present two classes of high-order iterative methods using the technique of weight functions in each step.

Acknowledgment

We thank all authors, participants, sponsors, editorial team, anonymous referees, and organizing team for their contribution in this special issue.

L. Jódar
E. De la Poza

References

- [1] C. Cookson and A. Jack, "Science stifled? Why peer review is under pressure," *The Financial Times (New York)*, 2008.

- [2] N. N. Taleb, *The Black Swan: The Impact of the Highly Improbable*, Random House Publishing Group, New York, NY, USA, 2007.
- [3] R. K. Merton, "The matthew effect in science," *Science*, vol. 159, no. 3810, pp. 56–62, 1968.

